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FACTS

Simply and Briefly Told
Concerning
Keystone Copper Steel



SIXTH EDITION



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Concerning
Keystone Copper Steel



(Sixth Edition)

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

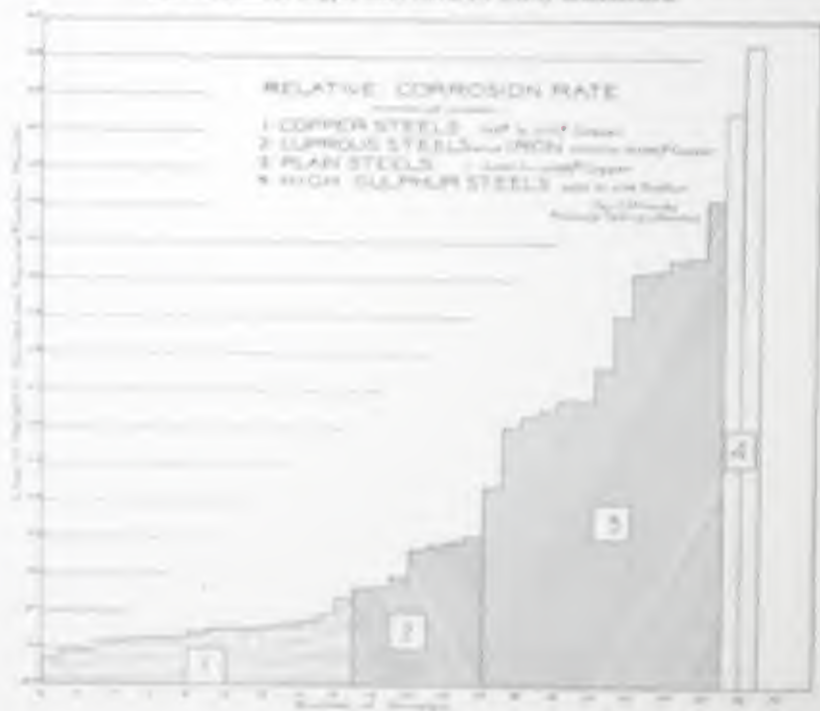
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GRAPHIC CHART

Showing common resistance of sheet metals exposed in weather tests at McKeesport, Pa.
The low losses in Copper Steel sheets are clearly demonstrated.



Best for all Purposes where Long Service is Desired



Simply and Briefly Told Concerning Keystone Copper Steel

KEYSTONE Copper Steel is an *alloy* made by the addition of a certain percentage of *Copper* to well made *Steel*, thereby greatly increasing its lasting qualities under actual service conditions. It has been scientifically developed and tested — and its use is strictest economy.

When we placed Keystone Copper Steel on the market in 1911 with the announcement that it was the most rust-resistant steel or iron to be obtained, our statement was received in some quarters with skepticism, and the remark was often made that "*Copper Steel*" was simply a catch term used to sell these products.

Sufficient time has now elapsed to *fully prove* that our claims were justified. Actual time and service tests have demonstrated the *absolute superiority* of Keystone Copper Steel for Black and Galvanized Sheets, Culvert and Flume Stock, Tin and Terne Plates, etc., and for all uses where long wear and resistance to rust are important factors.

Keystone Excellence is Established

When you buy Sheet Steel or Tin Plates, the products of our great mills, you are buying the combined excellence of good materials and craftsmanship—wrought in by the skill of conscientious and trained workmen.

These products render high class service, and are always reliable and trustworthy. In addition to this, a development of great importance to users of sheet metal is the alloying of steel with copper to increase *resistance to rust*—a well established metallurgical fact.

Many independent and unprejudiced service tests have resulted in hosts of staunch advocates of Keystone Copper Steel, who have proved its lasting qualities.

The demand for Keystone Copper Steel products has increased from 5,311 tons in 1911, to upwards of 300,000 tons annually. This enormous tonnage has been obtained not through extensive advertising campaigns, but largely by the recommendations of our customers who have satisfied themselves of the enduring quality of this alloy steel.

Naturally, this result is highly gratifying. It is not only an indication that the problem of corrosion is yielding to scientific research, but that consumers of Sheet and Tin Mill Products now realize that a reliable material which will resist rust and corrosion to a remarkable degree, is available at a very reasonable cost.

Actual Time and Weather Tests

Actual exposure to the weather is unquestionably the most practical and conclusive method by which to determine the lasting quality of sheet metals. The tests conducted have been most thorough and comprehensive in their character—all grades of uncoated sheets being exposed under widely varying conditions. The results in each case have demonstrated the high merits of Keystone Copper Steel.



One of a series of actual service test roofs covered with uncoated black sheets.
Note the superiority of Keystone Copper Steel.

To those who are still doubtful of the value of Keystone quality, we offer this suggestion—make a test of your own. We do not ask you to rely upon ours. We *do* ask, however, that tests be impartial and that you be *sure* the sheets used are just what they are represented to be; and that the regular steel and “pure irons” do not analyze over .02% copper. How to prepare the sheets and make such a test is explained on another page.



Section of weather proofing covered with (assumed) lead plating and exposed to weather in Pennsylvania State region.
This construction should maintain other tested at 5 inches.



Same wall after about 10 years' exposure. Note how much the old weathering has deteriorated.
(Compare this) with the weathering in the first photo.

Best for Cornices and Skylights



Section of another weather test roof of uncoated black sheets at McKeesport, Pa. The ability of Copper Steel to resist corrosion is very marked



Another view of same test roof after about 2 years' exposure. "Pure Iron" Panel 50 falling rapidly. Copper Steel sheets in splendid condition

Results of an Unbiased Test

In 1916 the American Society for Testing Materials started comprehensive corrosion tests of uncoated sheets, in different characters of atmosphere and including the following types of materials:

Copper Bearing Open Hearth Steel.	Non-copper Bearing Open Hearth Steel.
“ “ Bessemer Steel.	“ “ Bessemer Steel.
“ “ Puddled Iron.	“ “ Puddled Iron.
“ “ Pure Iron.	“ “ Pure Iron.

The following table and conclusions are quoted verbatim from the report of Committee A-5, American Society for Testing Materials, at the meeting of the Society at Asbury Park, N. J., June 21-24, 1921:

“A summary of this data (*Table XIII, Pittsburgh Test*), grouping the heavy and light gauge sheets according to copper content into copper-bearing and non-copper-bearing metals and showing the percentage rate of failure in each group of sheets at each inspection in terms of total sheets, is presented in an effort to offer a ready means for comparing rust resisting properties of copper-bearing and non-copper-bearing metals under atmospheric exposure of uncoated sheets at this location.

Type Designation.	Gage.	Number of Groups.	Total Number of Sheets.	Number Failed.	Total Failures at Each Inspection, Expressed as Percentage of Total Sheets of Each Type Exposed.							
					10 Mo.	16 Mo.	22 Mo.	28 Mo.	35 Mo.	41 Mo.	46 Mo.	52 Mo.
Copper-Bearing . . .	16	14	132	none
Non-Copper-Bearing	16	11	126	54	none	none	none	10.3	15.9	26.2	32.6	42.9
Copper-Bearing . .	22	15	146	93	none	none	1.4	4.1	13.7	27.4	44.5	63.7
Non-Copper-Bearing	22	11	84	82	none	35.7	79.7	91.6	94.0	96.4	96.4	97.6

“It will be observed that the heavier gauge non-copper-bearing sheets showed failures at the end of 28 months, with additional failures at each subsequent inspection, so that at the present time 42.9 per cent of the sheets have failed, whereas the heavier gauge copper-bearing sheets have not shown any failures up to the time of the last inspection.

“The failures in the lighter gauge non-copper-bearing sheets appeared very prominently in the early periods of the test, 91.6 per cent of these sheets having failed at the end of 28 months, whereas for the same period only a few copper-bearing sheets had failed, and while at the end of 52 months’ exposure 63.6 per cent of the lighter gauge copper-bearing sheets had failed, this result on the whole represents a superior condition to that found for the non-copper-bearing sheets at the end of the 28-month exposure period.

“The results of the observations at the Pittsburgh tests have now reached a point where we may definitely conclude that copper-bearing metal shows marked superiority in rust-resisting properties as compared to non-copper-bearing metal of substantially the same general composition, from which superiority we may truly anticipate a marked increase in the service life for copper-bearing metals under atmospheric exposure of uncoated sheets.”

Convincing Proof by a Competent and Impartial Authority

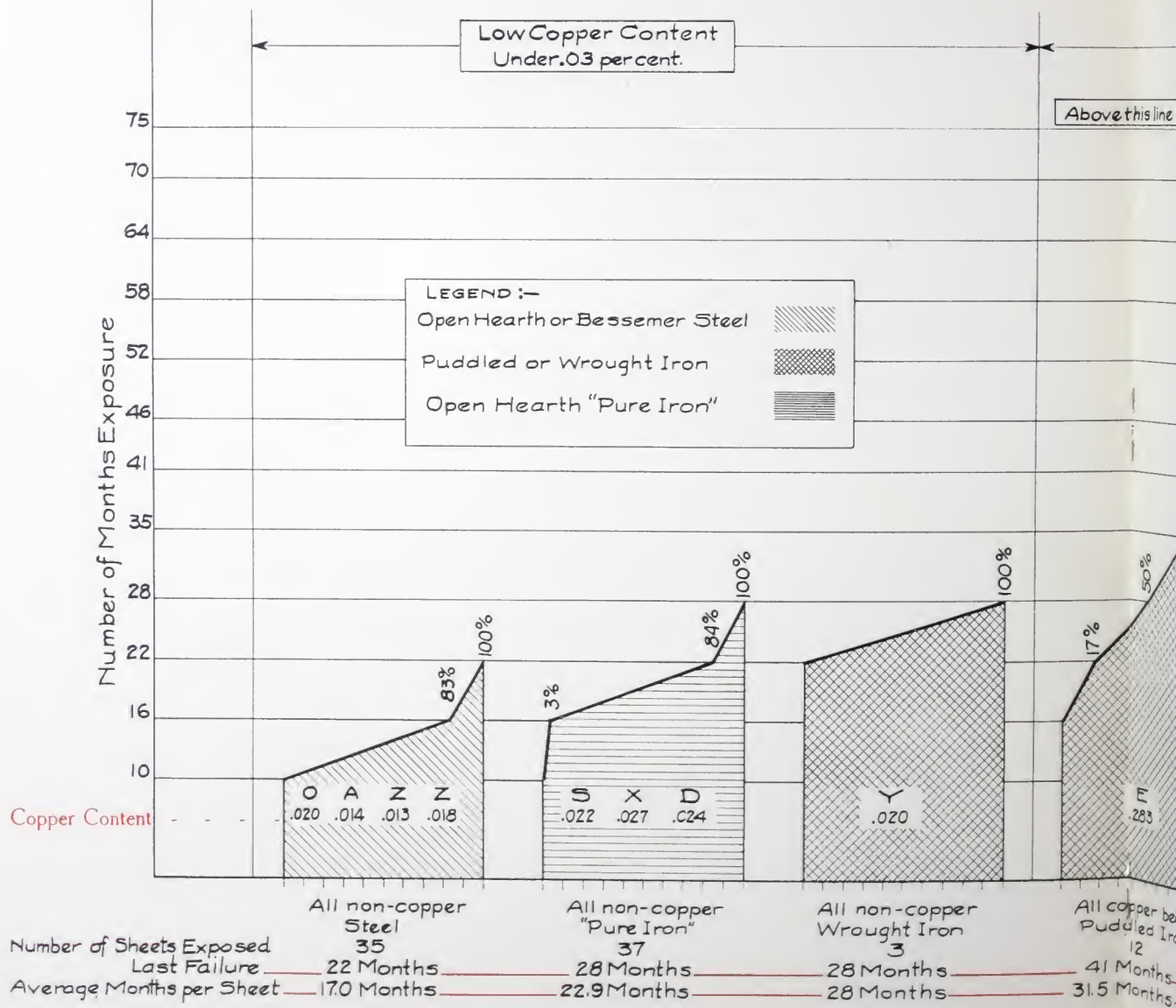
The Graphic Chart shown on the following double-page is based upon the 1923 Report of weather Tests made by the American Society for Testing Materials, as conducted on government property at Pittsburgh. Could you ask for better evidence of the superiority of Copper Steel?

These tests were conducted with *uncoated* black sheets, 22 gauge, exposed side by side on specially constructed test roofs. The ability of Copper Steel to resist atmospheric corrosion is clearly established beyond successful contradiction.

A careful study of this interesting Chart will convince you of the advantages of the copper steel alloy.

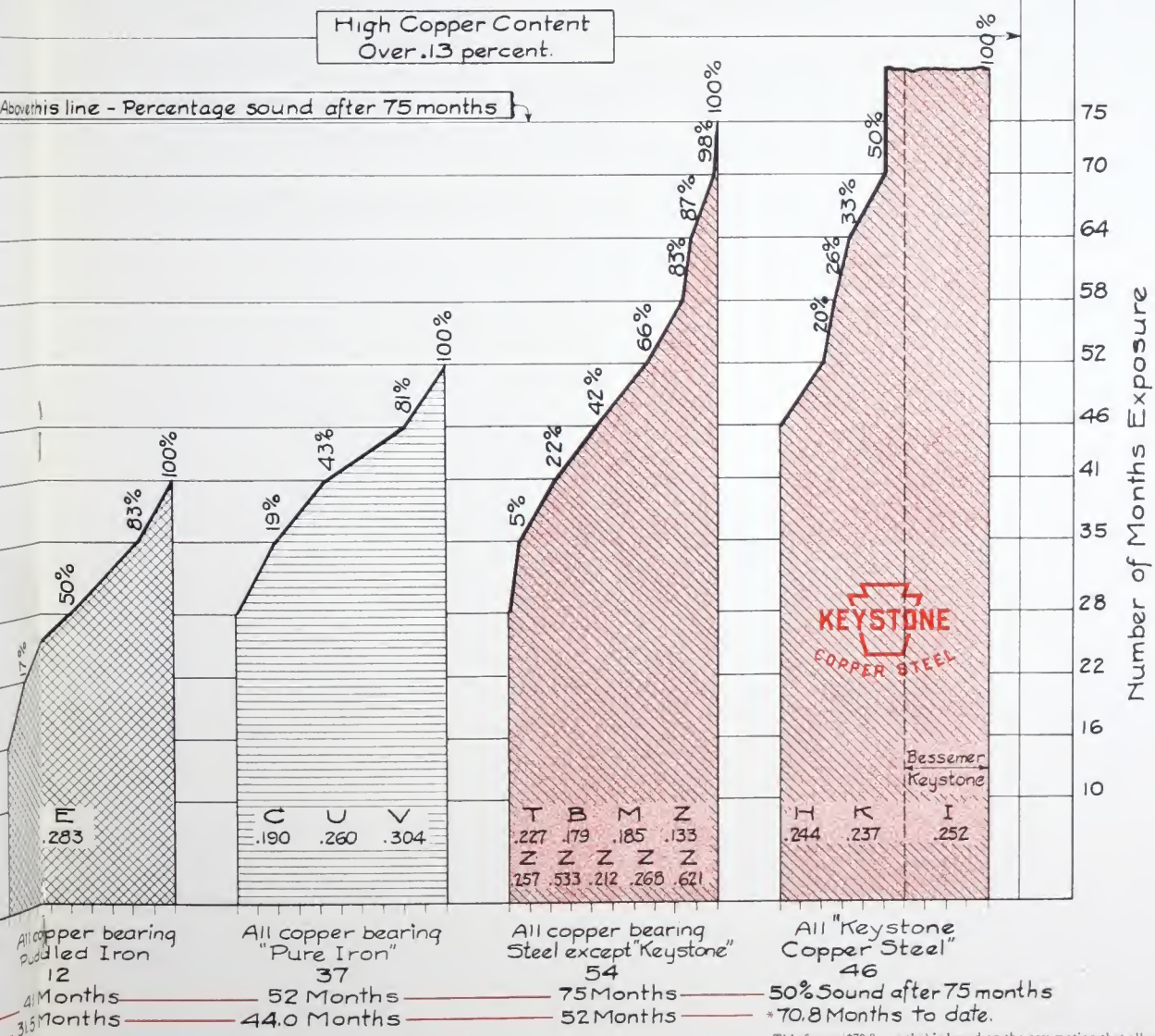
GRAPHIC CHART SHOWING CORROSION FAILURES OF No. 22 GAUGE SHEETS

Tests made at Pittsburgh, beginning December 12, 1916, by American Society for Testing Materials.
Prepared by American Sheet and Tin Plate Company from data in Report of Committee A-5 given
in Table II, Plate II, Proceedings of American Society for Testing Materials, Vol. 23, 1923, Part I.



(NOTE - Copper Steel is shown in Red.)

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en
I.



This figure (*70.8 months) is based on the assumption that all remaining sheets would have shown failures in another six months' period, and is for this reason probably too low.

Better Sheet Metal Work

More enduring sheet metal work will follow use of higher quality Sheet and Tin Plates. This is why you should demand Keystone Copper Steel.

For all purposes to which sheet steel is adapted, above or below the ground, Keystone gives the maximum of lasting service and satisfaction. The cost is so reasonable that it brings this alloy within the reach of all interested.

Each product of Keystone quality has behind it a service—the scope of which represents a tangible value to the use.

Facts to Remember

Keystone Copper Steel is an *alloy* made by *adding* a certain amount of Copper to well made Steel.

Copper added to Steel is *not* an impurity, any more than Copper is an impurity in Brass or Bronze. It loses its identity as a metal by becoming thoroughly diffused with the Steel—thus forming a *new metal or alloy*.

Copper in Steel *does not increase* corrosion. On the contrary it *retards* corrosion. The illustrations speak for themselves. If you do not believe them, make a test of your own.

Copper in Steel increases its *ductility*—makes it more workable. If you doubt this statement, place a trial order. Let us prove it.

The growing demand for Keystone Copper Steel is the best evidence of its excellence. Its high reputation has been fairly earned—and has come as the result of its undeniable superiority in the hands of the users.

Keystone Copper Steel products were awarded the GRAND PRIZE (highest award) for *general excellence* and *greatest merit*, by the Panama-Pacific International Exposition, San Francisco. This high recognition followed very thorough investigations by able juries. It confirms our claims for the high quality of this material.

How One User Conducted a Service Test

This test was made by a large eastern user of sheet metal. Black, uncoated sheets, 26 gauge, were taken from regular stock and after being carefully gauged and weighed were formed into pans, and placed upon a roof in a row, as indicated in picture below.



View of test pans upon the roof.

The above test gives a good idea of how little time and equipment are necessary to conduct a comparative test of iron and steel sheets on the market today.

The interesting results of this test are noted on the opposite page, and show clearly the surpassing *rust-resistance* of Keystone Copper Steel when exposed to the weather.

Best for Stoves and Ranges



#1-Keystone
Original weight, 44 $\frac{3}{4}$ oz.
Present " , 27 oz.
Loss , 17 $\frac{3}{4}$ oz.



#2-"Pure Iron"
Original weight, 43 $\frac{3}{4}$ oz.
Present " , 11 oz.
Loss , 32 $\frac{3}{4}$ oz.



#3-Standard Steel
Original weight, 43 $\frac{1}{2}$ oz.
Present " , 21 oz.
Loss , 22 $\frac{1}{2}$ oz.



#4-Charcoal Iron
Original weight, 40 oz.
Present " , 15 $\frac{1}{2}$ oz.
Loss , 24 $\frac{1}{2}$ oz.



#5-"Pure Iron"
Original weight, 40 oz.
Present " , 15 oz.
Loss , 25 oz.

At the expiration of the test period, the sheets were carefully inspected and re-weighed. The results are shown in the pictures. The splendid showing made for "Standard Steel" is due to the fact that on analysis it was found this steel contained a certain low percentage of copper. The small hole in Keystone sample is nail hole for attaching test pan to roof. The nick on right side is to indicate its number.

Tests by Another Metal Working Concern

This "out-in-the-weather" service test was also conducted with trays made from uncoated black sheets taken from stock, illustrations of which are shown herewith. The pictures tell the story.

This user makes the following statement — "Results have clearly established the superior merits that you have claimed for your KEYSTONE sheets."



A—Keystone Copper Steel.
Loss, 34 per cent.

B and C—Two widely advertised "rust-resisting" brands.
Loss, 42³/₁₀ per cent. Loss, 47¹/₂ per cent.

The uncoated pans or trays were placed on the roof of a building and allowed to remain there to meet rain, snow, ice, and all conditions of weather without interference, until period of test was concluded.

Similar results have followed practically every weather test of Keystone Copper Steel, and evidence clearly shows the excellence and lasting quality of the material. The years continue to add to the volume of proof of the increased rust-resistance of copper steel.

On What Will You Base Your Impartial Judgment?

When considering the relative merits of normal steels, Copper steels, and the “pure irons” (so-called), should you believe what somebody has told you *ought* to occur theoretically, or what someone has definitely *proved* to you *does* occur actually under service conditions?



Actual time and exposure wrought these results. These two sheets were exposed side by side for the same length of time. They were identical in manufacture—the same gauge, and from the same heat—the only difference being the *alloy of copper*; time and weather did the rest! Does it prove rust-resistance?



A few Practical Suggestions for Making a Comparative Atmospheric Test of Various Grades of Uncoated Sheets

Use any gauge of material desired, but quicker results may be obtained with lighter sheets—26 gauge, for example.

The samples should be first carefully cleaned of scale, either by sand blast or by immersion in a comparatively weak solution of sulphuric acid, and then thoroughly washed in lime water to neutralize the acid, and afterwards carefully dried. They are then ready for exposure. You will observe that this test requires very little labor or equipment. Try it.

This Symbol —  *Denotes Quality*

Apollo-Keystone Copper Steel Galvanized Sheets



Our well known Apollo Best Bloom Galvanized Sheets can be supplied with a base of Keystone Copper Steel. Insist upon having APOLLO-KEYSTONE Copper Steel Galvanized Sheets for

*Roofing, Siding,
Culverts, Tanks, Flumes,
and all exposed sheet metal work.*

These sheets insure greatest durability and rust-resistance. Look for the Keystone in connection with Apollo brand.

Keystone Copper Steel Black Sheets

Specially adapted for stoves, ranges, and all uses requiring the highest degree of corrosion resistance, without the use of protective coatings. These sheets give service unexcelled by any other iron or steel product on the market today. Keystone Copper Steel is supplied in all our standard brands of black sheets, if so specified.

Keystone Copper Steel Roofing Tin



Highest quality roofing terne plates manufactured—accurately resquared, uniformly coated, and stamped “Keystone Copper Steel” in addition to the brand and weight of coating, as indicated by MF brand. Our standard terne plates are made exclusively from Keystone Copper Steel:

MF—32 lbs. coating
U. S. EAGLE—40 lbs. coating
AMERICAN OLD STYLE—40, 35, 30, 25 and 20 lbs. coating.
AMERICAN NUMETHODD—40, 30 and 20 lbs. coating.
AMERICAN—15, 12 and 8 lbs. coating
AMERICAN FIRE DOOR STOCK—20 lbs. coating

We also supply Copper-Steel Terne Plates under jobbers' private brands. It is to your interest, however, to see that such plates are stamped “Keystone Copper Steel.”

Keystone Copper Steel Bright Tin Plates

Fill a long felt want with canners and packers of commodities which actively attack the base of Tin Plate—such as cherries, blueberries, etc. Keystone Copper Steel is supplied in our American Coke and American Charcoal Tin Plates on specification. Write nearest District Sales Office for full information.

American Sheet and Tin Plate Company

Manufacturers of Sheet and Tin Mill Products
for all purposes

Apollo Best Bloom Galvanized Sheets
Apollo-Keystone Copper Steel Galvanized Sheets
Black Sheets of Every Description
Keystone Copper Steel Black Sheets
Keystone-Wellsville Polished Steel Sheets
Corrugated Sheets—Black, Painted, Galvanized
Formed Roofing and Siding Products
Keystone Copper Steel Terne Plates
Automobile Sheets—all Grades
Sheets for Electrical Apparatus
Special Sheets for Stamping
Long Terne Sheets
Bright Tin Plates
Black Plate, Etc.

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